

COPS SOFTWARE IMPROVEMENT AND ADJUSTMENT

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March-May 2000

The main aim was to make working the new COPS boards, developed by Sten Hansen.

Software for the on-board ADSP2185L DSP processor has been written by Eric Cowden and John Lofgren ("COPS SOFTWARE USERS GUIDE" 11/22/99).

Development tools for the Analog Devices assembly language were kindly lent by Sten Hansen. Sten also answered questions arising.

Most of modification were related with UART's, since beginig, when there were no responses from COPS card.

History of modifications is depicted in addendum.

Here are the main modifications in software:

- ☐ Multiple echoes and prompts on power-up are removed.
- ☐ Transmitting throw UART's are made buffered, thus eliminating data corruption while reading CCD data to the PC.
- ☐ Work with UART's control registers is corrected.
- ☐ Internal delays adjusted.
- ☐ Two new commands added (see HE command output, or addendum below).

Files

All required files are on the diskette in directory A2.1c.

acops.dsp
acops.sys
acopsboo.BNM
asm.bat
asmsplfx.bat
bnmfix.exe
improve.doc
makebnm.bat
makeboot.bat
MAPREAD.EXE
shortbnm.bat
What.txt

This is a copy of *C:\align\cops\acops\A2.1c* directory on CMSPROJ05 computer.

Addendum

History of modifications as from source acops.dsp file

(in reverse chronological order)

A2.1c 10-17 MAY-2000 acops.dsp

- ◆ .CONST Max_Number_of_Boards = 21; (initially 8)
- ◆ At startup init:
 - SET FL1; SET FL2; changed to RESET FL1; SET FL2;
- ◆ FL2 (+5V power supply for ADC) is not switched off, AP0 affects FL1 (9V) only.
- ◆ All previous allow decreasing POWER UP timeout for CC command, and making more reliable work.
- ◆ At startup init:
 - Multiple prompts and echoes are eliminated.

A2.1b 25-APR-2000 acops.dsp

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- .CONST Max\_Number\_of\_Boards = 17; (initial 8)
- At startup init:
  - SET FL1;SET FL2; changed to RESET FL1;RESET FL2;
- Old Boards problem with this program is, that works OK in path-throw mode and if first in chain, but if not 1st misses characters on CD command.
  - Solution: check TSR,THR both ready before IO(UARTx) (DONE)

A2.1a 21-APR-2000 acops.dsp

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- New subroutine added:
 - Send_CharBA - used at UART-B receiver interrupt service only
 - This affects Send_CharA also.
- Added: RESET FL0; SET FL0; in the Echo-back ISR

A2.1 18-APR-2000 acops.dsp (from BCOPS.DSP V2.0 (see below))

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- Added ability to read CCD-s on ALL boards simultaneously and output CCD data in one reading;
  - Two new commands were entered:
    - CA - Convert All (Convert\_All\_CCD)
    - PA - Print All (Print\_All\_CCD)
- Conversion\_Done\_Flag - now used in for the end of conversion only
- Char\_Recently\_Sent\_Flag - the only used for path throw control

B2.0 bcops.dsp ( originally DCOPS.DSP V1.1b (see below))

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- ◆ Modified, to provide asynchronous buffered transmission in both directions to eliminate possible data overrun in chain for large transmissions.
- ◆ Byte transmit calls are done from the timer interrupt service routine.
- ◆ While any transmit is active, timer interrupt interval is as follows:

3. UART's DLL,DLH setting with retries
4. SPORT1 Setting changed: set external clock

V1.1a 24-MAR-2000

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1. Send_CharA has been modified in waiting of THR and Shift reg. ready
Now, after putting char in THR, waits either THR or Shift reg state
is changed, then waits both are ready
 2. CC command (Convert_Ctrl) is modified, added clearing
of Pixel_Effect_n arrays (n=1,2,3,4)

V1.1 ~ 20-MAR-2000

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1. +5v +9v are enabled on StartUp (FL1,FL2)
 2. IO memory wait states are chandeg to 7 (was IOWAIT0=5)
 3. Init_System corrected (jumps to Next_CharLine and Char_Erase,
that could force us to continue in Get_Line routine
 4. Send_CharA has been modified in waiting of THR and Shift reg. ready
 5. Send_CharAA has been removed as duplicating
 6. UARTDIV symbol definition added (C style) for UART's divisor value.
Default value is set to 11 and can be changed at compile time.
For example, command:

MAKEBOOT dcops dcops04d "-dUARTDIV=4"

will compile, and produce bootable 'dcops04d.bnm' file,
where UART's divisors will be set to 4.